

DOCUMENT RESUME

ED 085 307

SO 006 731

AUTHOR Walker, Ed
TITLE Handbook on Inquiry Teaching for Elementary School Social Studies.
INSTITUTION Nebraska State Dept. of Education, Lincoln. Div. of Instructional Services.
PUB DATE 73
NOTE 30p.
EDRS PRICE MF-\$0.65 HC-\$3.29
DESCRIPTORS *Discovery Processes; Elementary Education; Guidelines; *Inquiry Training; Learning Activities; Learning Processes; Models; Problem Solving; *Social Studies; *Teacher Behavior; *Teacher Developed Materials; Teaching Guides; Teaching Techniques

ABSTRACT

Elementary teachers and principals enrolled in an elementary education graduate course developed this guide which interprets and applies the concept of inquiry teaching and learning. The purpose of the guide is to bridge the gap between the theory of the inquiry process and its use in the classroom. It is written for use by elementary educators as a model for their teaching methods as well as the construction of social studies learning activities. The first of the two major sections of the guide is designed to introduce teachers to the inquiry method of teaching and learning. Answers to basic questions about inquiry are provided and each step of the process is explained. The second section provides examples of applications of the inquiry process. Each step of the process is explained with a discussion of teacher behavior and samples of implementation activities. The bibliography lists related books, periodical articles, and pamphlets. (Author/KSM)

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY.

ED 085307

HANDBOOK on INQUIRY TEACHING

for
ELEMENTARY SCHOOL

54006731

SOCIAL STUDIES

ED 085307

**HANDBOOK ON INQUIRY TEACHING
FOR ELEMENTARY SCHOOL SOCIAL STUDIES**

Under the direction of Dr. F. William Sosow, Professor of Elementary Education, University of Nebraska at Lincoln.

Coordinated by

Ed Walker
*Social Studies Consultant
Nebraska Department of Education*

Issued by

Division of Instructional Services
LeRoy Ortgiesen, Assistant Commissioner

Cecil E. Stanley
Commissioner of Education

George Rotter
Editor of Publications

Royal Henline, Administrator
Curriculum Services

233 South 10th Street

1973

Lincoln 68508

STATE BOARD OF EDUCATION

Gerald T. Whelan, President	Hastings
(District 5)	
Mrs. Marilyn Fowler, Vice President	Lexington
(District 7)	
Frank E. Landis	Lincoln
(District 1)	
R. Jerry Hargitt	Omaha
(District 2)	
Walter L. Moller	Wayne
(District 3)	
Willard H. Waldo	DeWitt
(District 4)	
Mrs. Shirley A. Peterson	Amelia
(District 6)	
F. Y. Knapple	Omaha
(District 8)	

Developed by

Miss Beverly Baumgart
Kindergarten teacher, Columbus Public Schools

Miss Dorothy H. Bstandig
3rd grade teacher, St. Benedict, Kansas

Mrs. Ruth Epley
5th and 6th grade teacher, Brock, Nebraska

Mr. Dale G. Jensen
Principal, Bellevue, Nebraska

Mrs. Laura Judkins
6th grade teacher, Hartington, Nebraska

Miss Barbara Lechtenberg
2nd grade teacher, Millard, Nebraska

Mrs. Evelyn Martin
5th grade teacher, Valparaiso, Nebraska

Mr. Ronald Pauls
Teacher-Principal, Henderson, Nebraska

Miss Caryl Peters
2nd grade teacher, Millard, Nebraska

Mr. Stanley Troxel
Teacher, Springfield, Nebraska

PREFACE

In recent years there has been a pronounced emphasis upon the process of inquiry or rational decision-making in elementary and secondary school social studies. This emphasis, however, has stemmed primarily from theorists, especially at the college and university level. We have found that implementation of learning activities which bring sound inquiry processes into the classroom on a consistent and continuing basis is an arduous and rather slow process.

During the summers 1967-1968, the Nebraska Department of Education and the University of Nebraska held workshops aimed at developing a theoretical framework for utilizing the process of inquiry in Nebraska's elementary and secondary schools. As a result of these summer workshops, the Nebraska Department of Education published in 1971 a pamphlet entitled *A Philosophy for the Teaching of the Social Studies*. This has been distributed to educators throughout Nebraska who desired to develop a theoretical position, either personally or for the social studies department of the school.

The *Handbook on Inquiry Teaching for Elementary School Social Studies* is intended to assist elementary teachers and administrators in bridging the gap between theory and practice. It is a practical publication with examples of the various steps in the inquiry process. We hope that elementary educators will use the handbook as a model for their teaching methods as well as the construction of social studies learning activities.

Finally, we wish to express our gratitude to Dr. Sesow and the students of Elementary Education 814 who designed and built this pamphlet. It is a logical step from philosophy and should be extremely valuable to educators in our state.

Cecil E. Stanley
Commissioner of Education

INTRODUCTION

This guide was developed by elementary teachers and principals enrolled in an Elementary Education graduate course at the University of Nebraska, Lincoln, during the 1972 summer session. Its contents reflect an interpretation and application of inquiry teaching and learning as presented in the State of Nebraska Department of Education publication *A Philosophy for the Teaching of the Social Studies*.

The guide is divided into two major sections. The first section is designed to introduce teachers to the inquiry method of teaching and learning. This section provides answers to basic questions about inquiry and explains each step of the process. The second section of the guide provides examples of the inquiry process applied. Each step of the process is explained with a discussion of teacher behavior and samples of implementation activities.

Although not included in the Nebraska inquiry model, a final step of "action" is suggested. It was the belief of those involved in the development of the guide that if the inquiry process is to have meaning and relevance to elementary school children, they should be able to take a course of action as a result of reaching tentative conclusions. An understanding of the inquiry method will encourage application of this approach to considering important issues and problems which will produce behavior of responsible citizenship.

The elementary teachers and principals responsible for the development of this guide are to be commended. They have provided a resource that will assist their fellow teachers in meeting the goal of *education for citizenship*.

WHAT IS INQUIRY?

Inquiry teaching and learning is not new? It dates back to Socrates and is based on principles which have always been used by good teachers. You may already have been using inquiry; but until recently this method has not been widely advocated for use in elementary school social studies programs. Inquiry stresses learning skills by which students can examine alternative positions to problems or issues. It refers to a kind of teaching and learning that is based on involvement and investigation on the part of the pupil and teacher. Inquiry is a process which emphasizes a number of skills: observing, classifying, analyzing, inferring, hypothesizing, gathering data, reaching conclusions and supporting conclusions. If you can answer the following questions in the affirmative, you are employing the process of inquiry.

1. Do you believe that children can learn by themselves and from each other? Do you guide them in this direction?
2. Is your classroom full of items that tend to excite children and arouse their curiosity to the point that they are anxious to explore and study new and unfamiliar issues?
3. Does the learning environment that you have set for children extend beyond the four walls of the classroom and into the outside world?
4. Do you confront children with or guide them to ask questions that go beyond repeating what they have read or seen? Are they stimulated to analyze, explain and evaluate situations? Do you provide a variety of opportunities for them to apply what they are learning?
5. Do you encourage your children to explore and suggest possible solutions to social problems and important issues that have not or cannot be resolved? Do you encourage open-endedness in your classroom?
6. Do you create a learning environment which encourages children to support their decisions and actions through seeking valid information rather than untested opinions?

WHY USE INQUIRY?

Take a few minutes to look at your class. Consider them in a very special way by projecting their lives into the future. Try to see these young people as future teenagers, as young men and women and finally as mature adults. How are they reacting to their social environment? Are they fully prepared to meet its many problems and challenges?

Drugs, pollution, and racial prejudice are a few of the everyday problems and challenges that face all of us. Your students will be a part of this. Will they be puzzled and frustrated by it? How many will say, "That's Life," and just go on? Hopefully, others may be wondering what they can do to improve conditions, and through the decision-making process, will take the initiative to find workable solutions.

There are four major reasons for using inquiry in the elementary school. First, it places stress upon those skills of learning, such as decision-making, which can be used throughout life; second, it provides a way by which students can learn to discover on their own; third, it provides a way to apply social science content in order that acquired skills and knowledge can be functional and meaningful; and fourth, it increases student interest in learning.

WHY IMPLEMENT INQUIRY AT THE ELEMENTARY LEVEL?

Inquiry can be used at the elementary school level as well as at the secondary school level. There are several excellent reasons for implementing inquiry at the elementary school level.

Children, of course, begin their formal education having acquired a tremendous amount of knowledge. This acquisition of knowledge, although limited in scope, has basically been acquired through an inquiry approach. The task of the elementary school then becomes one of continuing and refining this natural way of learning. Using the inquiry method, a functional application of knowledge and skills may be realized.

Another important reason for implementing inquiry at the elementary level is that elementary teachers "traditionally" have been concerned about the total development of the child. Inquiry helps the child see the relationship of a problem or issue as it affects the many facets of his life.

ARE THERE CAUTIONS IN USING INQUIRY?

Children must be helped to see and understand that in inquiry teaching and learning, if it is true inquiry, problems and issues have many alternative answers and solutions. Unlike the area of science where alternatives will lead to a logical, scientific conclusion, no such guarantee can be given in the study of social problems and issues.

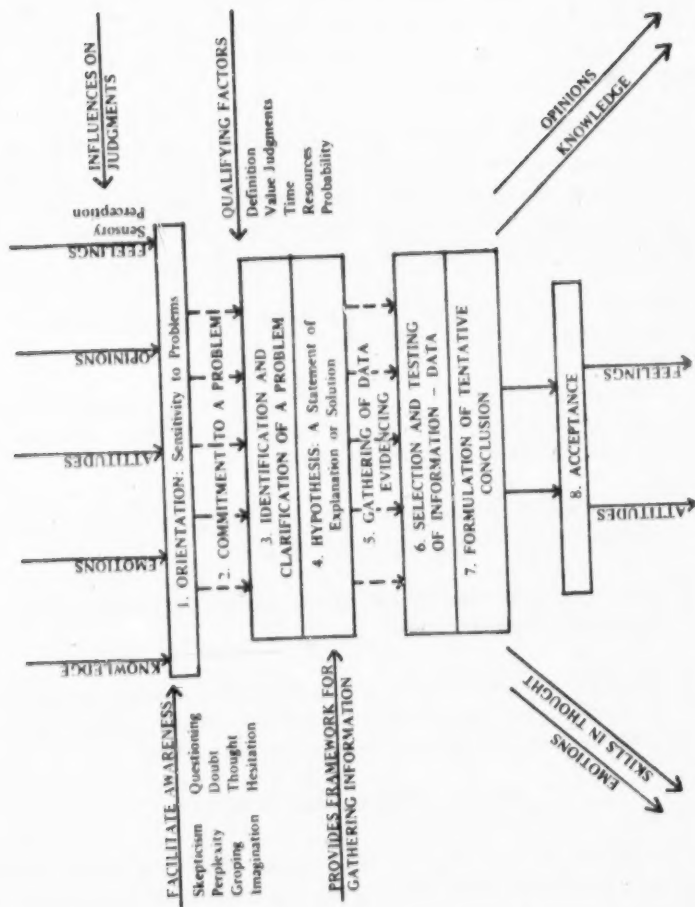
One other caution teachers might well need is that the subject of the problem or issue be one that is appropriate for the learner. Just as children have a readiness for certain skills, readiness must be considered for the students using inquiry. Along with readiness, age, grade level, and maturity, the homelife of the students must be considered by the teacher.

There are endless topics that are inquiry oriented. These topics have certain characteristics, some of which are the following:

1. *Persistent Issue*—It is an important problem to a large number of people. It has historical precedence in that men have wrestled with it over the ages. It cannot be easily resolved.
2. *Controversial Issues*—There may be many conflicting interests, beliefs, and opinions surrounding this issue.
3. *Legitimate Difference of Opinion*—There are different attitudes and suggested courses of action.
4. *Used for Complex Thinking*—This kind of a problem requires the students to perform at various levels such as comparing, observing, classifying, interpreting, and looking for assumptions.

INQUIRY PROCESS OR MODEL

In this portion of the guide, a detailed explanation of the inquiry process is presented. The model presented is from the publication of the State of Nebraska Department of Education entitled, *A Philosophy for the Teaching of the Social Studies*. The selected model follows on the next page.



The model was adapted to fit the following five steps. It will become obvious that steps from the model have been combined to form a simplified model.

- I. The first step the teacher and student would use is *Identifying the Problem*. Here the students acknowledge and define a problem. It is imperative that the students become involved in the problem situation. Motivation of the students is extremely important. The teacher should not impose his ideas and interests in this problem upon the students, but should let ideas and interests in the problem come from the students themselves. The teacher's role in this step is one of learner, motivator, observer, participator, and inquirer.
- II. The second step in this process is *Formulating a Hypothesis*. The teacher should encourage the students to explain the problem in order to clarify it and to suggest necessary investigations to identify alternative solutions. A hypothesis is a statement which is proposed as a possible solution to a problem. It is tentative and provisional. It may be only a guess, idea, or hunch. Instead of depending upon the teacher for direction, the students suggest possible directions for investigation through the formulation of guiding hypotheses.
- III. The next step in this process is *Collecting, Organizing, and Evaluating Information and Data*. It is important that the students, as a group, individually, or as a class, have gathered data which is directed toward the various hypotheses. The students and the teacher organize and evaluate this data so that it either supports the hypotheses or suggests other possible conclusions. Cautions: the teacher must not impose her organizations or evaluations on the students. The students, along with the assistance of a teacher, can form their pattern of organization and evaluation.
- IV. The fourth step is reaching *Conclusions Based on Collected Data*. The students draw their own conclusions about the hypotheses. As the conclusions are subjected to testing and use, they will be broadened and often modified. This process of generalizing and continually testing the generalizations in different situations is very important. The students should make their own conclusions and not have to depend upon the teacher's assistance.

- V. The last step in this inquiry process is *Action*. If the students have really been interested in the investigation, they will want to take a course of action individually or as a group. It is not imperative that action has to be taken. If the opportunity arises and the students are interested, they may proceed with the activity.

Pollution is a topic which lends itself easily to the inquiry method of instruction. Within this broad topic, there are many areas such as land, noise, air, space, water, people pollution, etc.

Pollution has been used as a vehicle for implementation of the inquiry process, but the individual class and teacher in any school in Nebraska may explore any problem area using the five inquiry steps. There are other broad topics which adapt to the characteristics of an inquiry-oriented problem previously mentioned. Some other suggestions could be:

1. Should there be school twelve months a year?
2. What makes a hero?
3. What is good citizenship?
4. How do people spend money?

EXAMPLE OF INQUIRY APPLIED

I. *Identifying the Problem*

- A. *Explanation of the Step*—The first part of the inquiry process is identifying the problem. This step of the inquiry process is concerned with motivating the students to gain insight into the student's interests and previous experiences in an area. The students must acknowledge and define a specific problem. It is of great importance that students become motivated and involved in the problem situation.
- B. *Teacher Behavior*—The teacher's behavior in this step is one of guide, motivator, learner, and observer, not in the specific sense of "you will see this and do this," but as the Gad Fly or Socratic questioner. The teacher will allow the students to ask and answer

their own questions which hopefully would lead to more questioning and answering by the students. The teacher should be a participator in the activities. The teacher must caution himself not to inflict his ideas or interests upon the students, but should let the ideas and interests develop from the students.

Inquiry is a student-directed search for knowledge. The teacher's role is important because he must keep the students "on the right track," but he must not "take" them to their destination by dictating to them. The teacher should stimulate the student's interests by using questioning techniques which promote creative and critical thinking from the students, not the traditional "Predetermined" approach. It must be remembered that inquiry is a *student-oriented* process.

C. *Activities--*

1. *Bulletin Board Technique--*(Primary) Display a large, colorful character of the national pollution symbol—"Woodsy the Owl" and his motto "Give a Hoot, Don't Pollute" as the title on a bulletin board. Briefly discuss with the students ideas as the effectiveness of the choice of Woodsy as the pollution fighter: What is their idea of pollution? What ways could they help Woodsy? What do you think pollution is?

This activity would especially appeal to most lower primary children because of their attraction to animals and fantasy while also surveying their previous experiences with pollution.

(Intermediate)—The words "Does Our Town Have a Pollution Problem?" accompanied by a large question mark could be displayed on a colorful bulletin board. There could also be a display table under the bulletin board for further use. Through the children's questions concerning the bulletin board and the display table, a discussion of pollution could result. Some ideas that would be valuable to be discussed would be: What is pollution? Who causes pollution, if anyone? What types of pollution are there? Is pollution harmful? Discuss places they have seen pollution, how bad is something before it is considered polluted, what are some evidences of pollution and is it always evident?

A bulletin board would be a good motivating device because it is usually large and obvious. The bright colors would motivate the students to inquire as to the meaning of the question mark.

2. *Resource Person Technique*—(Primary and Intermediate) A resource person such as a State Game Commissioner, Game Warden, or District Soil and Water Conservationist could be invited to speak to the class as a beginning activity. These people could help to motivate the students into a discussion on pollution.

The use of a knowledgeable resource person would be a good motivating device because he has had special training in his particular field. During the question-and-answer session, the student's attention could be directed to the bulletin board (previously described). This can be done by either the teacher or the resource person.

3. *Story Technique*—(Primary and Intermediate) Teacher could read the Greek myth of Pandora's Box, emphasizing the idea that the box had been given to Pandora by Zeus for safe keeping. After briefly discussing the legend, the teacher might pose the question, "Pretend that pollution escaped from Pandora's box. What might have happened? Do you think that pollution could have really escaped? Why do you think so?"

This exercise could be used in the upper grades to correlate with their experiences in mythology. To be applied at the primary level, the myth would need to be modified and retold in the teacher's interpretations.

4. *Field Trip Technique*—(Primary and Intermediate) Take a field trip to observe vegetation, soil, and animals. The following questions could be asked: Is this a good place for animals, plants, and people to live? Is there anything wrong in this area? What would large amounts of wind and water do to this area and the living things in it? Has man changed this area? Has he helped or harmed it in any way? Do you think it will change in the near future? How do you think this change will take place?

The types of questions suggested for the field trips are designed to make students more aware of the conditions of the area, how it came to be what it is, and man's effect upon it. This thinking is needed to arouse curiosity about the conditions of the area and to foster the realization that conditions do change.

5. *Film Technique*—(Primary and Intermediate) Have the students view selected films dealing with pollution. The films should have various interpretations centered on nature and man's abuse of it. Briefly discuss the films with questions such as: Does this remind you of our area? Did you see any problems in the films? Do we have any of these problems?

The films and the questions following them will cause children to begin to focus on the problems of pollution. Their thinking can be narrowed to a smaller area upon which they may concentrate. Many pollution issues are important, but there are too many to be studied thoroughly at one time. Therefore, classification and confining to a certain problem needs to take place.

After the students are motivated to a problem, have identified and become committed to a problem, then they are ready to go to the next step in the inquiry process. But before moving on to the formulation of a hypothesis, the students need to begin to understand the problem by narrowing the definition, so that they will be able to continue the process of inquiry. If this step is not clear to the students, they may have difficulty in stating hypothesis, gathering data for the problem, and may become confused about the problem.

II. *Formulating Hypotheses*

- A. *Explanation of the Step*—It is in this step that the problem should be clarified and made manageable. This step is one of exploring alternative solutions and formulating tentative statements or hypotheses. To hypothesize is to guess, utilizing past experience, present available data, and a unique perception of the problem. It involves both deliberate step-by-step analysis and intuitive hunching; it may require considerable intellectual effort to arrive at a tentative hypothesis.

- B. *Teacher Behavior*—The teacher's role in this step is to help guide the students to verbalize the problem in order to clarify it. The teacher participates in the discussion and possibly provides suggestions necessary to investigate and to identify alternative solutions to the problem. The students may depend upon the teacher for direction, but should try to work out their own hypotheses.

Since inquiry is student-oriented, the teacher should be careful not to tell them what to study or how to go about it; but the students should be encouraged to develop alternative solutions. Experimentation and investigation by the students is the whole key to inquiry.

C. *Activities*—

1. *Creative Technique*—(Primary and Intermediate) These are unstructured activities performed by the students which will lead to the formulation of hypotheses. These are some activities that may develop through previous discussions:

- a. Write creative stories about their own experiences with pollution.
- b. Draw pictures showing their idea of pollution.
- c. From previous discussions, dramatize (pantomime) their reactions to polluted areas.
- d. Draw filmstrips or cartoons or make tapes of pollution *close to them*.

2. *Discussion Techniques*—(Primary and Intermediate) Have a general discussion on what they think the problem is and what they would like to research. The teacher may guide their discussion by asking questions similar to the following: Do you think our country, our school district, or our town has a pollution problem? Can we make a statement about pollution in our town? These experiences will lead the children to arrive at or form hypotheses. The class may arrive at one or more hypotheses which will then guide their further

study. The hypothesis provides a definite issue for which to collect data verifying and possibly nullifying it. It should be stated so that the students know exactly what they are trying to prove or disprove. With guidance, direction, and experience, the students could be lead to formulate a null or negative hypothesis.

Some hypotheses that the students may develop could be:

- a. We have a pollution problem in our community.
- b. People cause pollution.
- c. Only people can prevent pollution.
- d. We do not have a pollution problem in our community.

These activities and suggested hypotheses are adaptable to any area of pollution. Through these activities the students will define and clarify the problem. According to the resources available and the characteristics of a particular class, the number of tentative hypotheses will vary. After they have stated a hypothesis, the students are ready to gather, organize, and evaluate information or data.

III. *Collecting, Organizing, and Evaluating Information and Data*

- A. *Explanation of the Step*—In this step the class gathers all available information toward proving or disproving their hypotheses. The students gather data in or out of the school's environment through inquiry skills such as: interpreting and preparing maps, graphs, charts, and tables, observing, photographing, taping, classifying, recording, listening, measuring, and investigating. This requires the learner to engage in activities in which they translate the evidence into their own terms; evaluate it for relevance, accuracy, and validity; identify similarities, differences, trends, and patterns; seek relationships, regularities, and logical inferences among its parts; interpret it and search for significance and meaning in the results. Important in this stage of the learning are periodic references to the hypotheses being tested in order to keep students on the track and

also periodic reviews and summaries of the extent to which the data thus far examined supports or refutes the hypotheses.

- B. *Teacher Behavior*—The teacher's role should be one of an advisor when needed, an active participant, a guide, and most of all an interested and concerned supporter of the student's ideas and initiatives.

The teacher should make available all resource material (specialists, films, texts, or other such media) that would be pertinent to the problem. The students should also bring information. The teacher guides the students to organize and evaluate this information so that it either supports the hypotheses or suggests other possible solutions. The teacher must not impose her organizations, evaluations, or materials upon the students. The students should arrive at their own organizational and evaluation patterns.

The teacher's role in guiding this stage of the experience is crucial. The teacher may point out that evaluations may play a vital role in a person's ability to make a right decision. The teacher may apply the value clarification techniques in the classroom to help students clarify their own values.

If inquiry is to be meaningful to the teacher, he cannot have predetermined answers before research is begun or at any time in the process. Only through the evidence of student findings can the hypothesis be supported or rejected. If the teacher dominates or dictates this step of the process, the purpose of the whole process will be defeated. The success of inquiry can be determined when students come up with ideas of their own that the teacher has not thought of.

- C. *Activities*—

1. *Mapping Techniques*— Primary and Intermediate) This example would involve various activities in and out of school. A large map of the area, school district, city, county, or state will be needed for the activity. Display this map in a centrally located place where it is easily seen.

This activity is an excellent one for a functional use of map skills. Many inquiry skills are learned, such as observing, data collecting, evaluating, investigating, taping, or researching the problem.

These are samples of what the teacher could encourage the students to do in relation to the map:

- a. Students could mark on this map their own home.
- b. Students could mark on the map where any source of pollution could be found. Possible sites could include a camp site, factory, city dump, park, fairgrounds, and river or pond.
- c. Students could plot a route on the map for a nature walk or field trip through their community observing what they see. On this trip, take snapshots of areas proving and disproving their hypotheses. Take notes to record the data in a log. While on the trip, ask questions such as: Do you see anything here that proves or disproves the hypotheses we stated? Compare what you see here with other areas you have visited. Is there more pollution here or there? Bring back examples of some of the pollution that is there—bottles, cans, papers, etc. After analyzing the snapshots, the students could place them on the map in accordance to where they were collected.
- d. Water samples from a pond or river or any place a water source is found could be sent to the State of Nebraska Department of Health, Division of Laboratories, Box 94757, Lincoln, Nebraska 68509 to be tested. Results could be mapped to determine polluted areas.
- e. Using a student-devised code, the students could map polluted areas that have been observed. For example a noise pollution code could be this: airport with jets—red; trains—blue; semi-trucks—yellow; and cars—green. Using the code, the colors would represent on the map the data that was collected.

2. *"Keeping a Log" Technique*—(Intermediate) This activity involves keeping an accurate record of the student's collected data or findings. This may be done individually or as a group. This involves such inquiry skills as observing, comparing, collecting data, and recording. These are some of the activities that may be done in connection with this technique.

- a. *Interview*—Students could go on their own or in groups to question or discuss problems of pollution with businessmen, construction workers, highway maintenance personnel, mayor, city councilmen, housewives, and farmers. The objective of this interview session is to gain insight into how pollution affects these people and what they are doing about it. As the students interview one or more of these people, they should record important points in their log.
- b. *Resource Person*—Invite the soil conservation officer, state game commissioner, game warden, mayor, or policeman (sheriff) from your area and speak about pollution. The speaker may include such questions as: Is pollution a problem in your area? How severe is it? What are its causes? How could it be controlled? Students could label and mount in their log any material given to them by the speaker. They may also summarize the speaker's lecture in their log.
- c. *Graphing*— (1) Make a master copy of a chart plotted in half-inch squares. Down the left-hand side write glass, bits of paper, plastic bags, food, cans, gum, string, boxes, etc. At lunch time, give copies to several students and ask them to monitor the playground with a few children acting as recorders and as "spotters." The recorders are to place a checkmark denoting each piece of material dropped or thrown away by the other children on the playground. Discuss and record the results in their logs.

(2) Take a letter walk and pick up all the pieces of paper, etc., in a specified area such as the schoolyard, the park, their yard at home, etc. Count the results on a bar graph and have the students compare their results.

- d. *Observing*—During the winter, have the students observe and record in their logs the changing color of the snow. Students could discuss the question, "What could be causing the snow to change color?" Another observation activity is to display a sheet of white paper outside the school building, downtown, outside the city limits, or in the country. Students should observe the results on the sheet after a period of time. Have the students "guess" at the origin of the particles, giving reasons for their guesses.
- e. *Survey-Do Community E.Q.R.* (Environmental Quality Rating) of the community's resources. Start with 100 points and decide how many points should be allowed for each type of pollution to be rated. For example—jet noise— subtract 15 points, etc. After your community has been rated, compute the total of subtracted points. Compare your rating with these national scores:

0-100	Excellent
11-25	Good
26-50	Above Average
51-65	Average
66-80	Below Average
81-100	Poor

This activity coordinates with the National Wildlife Federations national yearly Environmental Quality Rating Survey.

Activities such as those described above are necessary so that the students will have objective evidence to verify or nullify the hypothesis. This evidence needs to be organized so that it can easily be evaluated. Students should be made aware of the limitations of their own ability to investigate. There are variables beyond their control which should cause them to become cautious about over-generalizing any results obtained.

After the students have completed collecting, organizing, and evaluating the data, they are ready to begin drawing conclusions from the data—the next step in the inquiry process.

IV. *Reaching Conclusions Based on Collected Data*

- A. *Explanation of the Step*—Once the data has been evaluated, it must be re-assembled in such a way that it can be meaningfully explained in relation to the hypothesis. This step concludes the validation stage of the inquiry process. It may merely be a restatement of the hypothesis or a reversal of it. The learners must be encouraged to state explicitly, if in somewhat general terms, the evaluation of data to the hypothesis being investigated. The students may derive many different conclusions resulting from their analysis of the gathered data. This, again, may be an individual, group, or a class activity; it may be oral or written.
- B. *Teacher Behavior*—The teacher, in guiding and participating in the development of these conclusions—the formulation of concepts, clarification of attitudes and values, statement of understandings—helps the learners to arrange evaluations among data into meaningful conclusions. The teacher should, through discussion, ask pertinent questions about the testing. The teacher should not test or make the conclusions himself, but help the students arrive at valid conclusions.

In this step, the responsibility for the conclusions is basically the students' since it is an interpretation and analysis of the students' data. However, the teacher as a participant should always be aware of the progress of all students and the kinds of research being undertaken. It is very important that the teacher allows the students to come to their own conclusions based on their data, cautioning them on avoiding broad generalizations from only limited data, since they will be using the inquiry process in future situations.

- C. *Activities*—Basically, the activities suggested in this step will be discussion-type activities, possibly initiated by a question posed by the teacher or a student.
1. *Discussion Technique*—(Primary and Intermediate) The following are questions which the teacher could suggest to the students to utilize their gathered data in formulating any conclusions: Are your resources valid? Did you check with many authorities? Are we justified in drawing this conclusion? Are your

resources pertinent to the problem? From the data collected, what can we say about our hypothesis? Is our hypothesis completely true? Completely false? Could our data show that one statement about our environment is true for some people and false for others? For whom might this statement be true? False?

The purpose of this activity is to see clearly the relationship between the hypothesis and how well it agrees with the data collected. Does the data support the hypothesis? Is the hypothesis completely verified or nullified?

2. *Hold a Court Scene Technique*—(Intermediate) Prosecution team members bring evidence to prove the hypothesis correct. A student panel could be the judge. The side presenting the most evidence and the best evidence may be judged the winner of the case. Pictures, graphs, and other materials could be brought as evidence. The objective is to draw a conclusion from the data gathered. Objectivity must be kept throughout the court scene.

3. *Town Board Meeting Technique*—(Primary and Intermediate) Hold a "town board meeting" with different groups assuming the roles of citizens bringing in complaints of pollutions. By presenting their collected data, the town board should propose conclusions and reasons for their decisions. The remainder of the class should vote on and discuss the conclusions.

The above activities require critical thinking and organization of their data to give answers to the questions posed. After the students have drawn a conclusion(s) about the hypothesis, they are ready for the last step of the inquiry process—the action step.

V. Action

- A. *Explanation of the Step*—The last step of the inquiry process is action. This is the part of the process where some courses of action are taken or where something is done in relation to the problem that has been studied. It is not imperative that any action has to be taken. If the opportunity arises and the students are interested, they may proceed with the activity. If the opportunity does not arise, the teacher and the students need not feel compelled to proceed

any further. If the students have been sincerely interested and committed to the study of the problem, they will be more than eager to do something about it. They will propose many different courses of action to take which vary from very simple to complex patterns. These patterns could be individual, group, or class activities. Inquiry is not meant to be the solution or conclusion to a problem, but the beginning of a never-ending process.

- B. *Teacher Behavior*—The teacher's behavior in this step of the inquiry process is again one of a guide, participant, and promoter of the students' ideas for action. The teacher should be careful not to set a pattern for the students to follow. The teacher could suggest examples of action, in case the students are not aware of possible things that could be done, but the students should make the final decision.

The final step of the inquiry method is a student-directed process. The action is the responsibility of the students. The teacher should also be the communication link between the students' proposed activities and the administration and patrons, in most cases sources of approval and support.

1. *Clean-Up Drive Technique*—(Primary and Intermediate) This is an organized effort on the part of the students to eliminate some evidence of pollution in our society. These activities could be used individually, in small groups, or as a class with any aspect of pollution. Several things may be done in connection with this activity. Among them are:

- a. Form a "Beautify Your Community" committee.
- b. Make posters warning about pollution and place them in various store windows.
- c. Write letters to appropriate personnel such as congressmen, county agents, mayor or city councilmen, etc.
- d. Collect pollutants to make objects such as man-cans. Beer-cans could be glued or tied together in the shape of a man.

- e. As an art project, the student could make car litter bags, decorate litter cans, etc.
- f. Publish findings of this study in local papers and visit other classrooms to discuss the problems of pollution. Suggest ways that they may help to control pollution.
- g. Write or visit with the mayor, city councilmen, businessmen, or plant managers giving them the results of the class study concerning pollution. A copy of the results could also be sent home to the parents.
- h. Display a collection of various pollutants. Included in this display could be pollutants and what they become after they are re-cycled.

Through taking a course of action, students can act as responsible citizens and find meaning and relevance in their classroom activities.

CONCLUSION

Providing elementary and secondary students with tools to meet the complexities of today's world and for problems and issues that will be confronting them in the future is a prime function of schools. Inquiry teaching and learning provides students with one of these tools by which students can examine alternative positions to problems or issues.

Although inquiry is a functional way that teachers and students can look at problems and issues, other teaching techniques, methods, and strategies will also have an important role in the total development of children.

Finally, the particular model selected and employed by the person using inquiry will be determined by the specific needs and circumstances of the teacher and students as well as the problem and issue at hand.

BIBLIOGRAPHY

BOOKS

- Abraham, Norman, Richard G. Beidleman, John A. Moore, Michael Moores, William J. Utely. *Interaction of Man and the Biosphere*. Rand McNally & Co., 1970.
- Beyer, Barry K., Carnegie-Mellon Uni. *Inquiry in the Social Studies Classroom, A Strategy for Teaching*. Charles E. Merrill Put. Co., 1970.
- Chase, Linwood, Martha Tyler John. *A Guide for the Elementary Social Studies Teacher*. Second Ed., Allyn & Bacon, Inc., 1972.
- Clements, H. Millard, Wm. R. Fielder, Robert B. Tabachnich. *Inquiry in Elementary Classrooms*. Bobbs-Merrill Co., Inc., 1966.
- Dunfee, Maxine. *Association for Supervision and Curriculum Development*. Elementary School Social Studies, A Guide to Current Research. N.E.A., 1970.
- Fenton, Edwin. *The New Social Studies*. Holt, Rinehart, and Winston, Inc., 1967.
- Goldmark, Bernice, Sonoma State College. *A Method of Inquiry*. Social Studies, Wadsworth Publishing Co., 1968.
- Hass, Glen, Joyce Cooper, Kimball Wiles, Dan Michalak. *Readings in Elementary Teaching*. Allyn & Bacon, Inc., 1971.
- Jarolimek, John. *Social Studies in Elementary Education*. Fourth Ed., Macmillan Co., 1970.
- Lavatelli, Celia Stendler, Walter J. Moore, Theodore Kaltsounis. *Elementary School Curriculum*. Holt, Rinehart, Winston, Inc., 1972.
- Mallan, John T., Richard Hersh. *No. G.O.D.'s in the Classroom, Inquiry and Elementary Social Studies*. W. B. Saunders Co., 1972.

Massialas & Cox. *Inquiry into Social Studies*. McGraw-Hill Series in Education, 1966.

McLendon, Johnathan Co., William W. Joyce, John E. Lee. *Readings on Elementary Social Studies: Emerging Changes*. Allyn & Bacon, Inc., 1970.

Michaelis, John U. *Social Studies for Children in a Democracy*. Fifth Ed., Prentice-Hall, Inc., 1972.

Ord, John E. *Elementary School Social Studies for Today's Children*. Harper & Row Publishing Co., 1972.

Ryan, Frank L., University of Minnesota. *Strategies Involvement and Inquiry Exemplars for the New Social Studies*. Prentice-Hall, 1971.

Sale, Larry L., Ernest W. Lee. *Environmental Education in the Elementary School*. Holt, Rinehart, and Winston, Inc., 1972.

Skeel, Dorothy J., Editor. *The Challenge of Teaching Social Studies in the Elementary School*. Goodyear Publishing Co., Inc., 1972.

Thomas, R. Murray, Dale L. Brubaker. *Decisions in Teaching Elementary Social Studies*. Wadsworth Publishing Co., 1971.

PERIODICALS

A Workshop for Teaching Social Studies Through Inquiry. State of Nebraska, Department of Education.

Beyer, Barry K., "Africa Through Inquiry," *Social Education*, February, 1971, Vol. 35.

Brennan, Matthew J., Director of Pinchot Institute. *Teacher's Curriculum Guide to Conservation Education*. J. G. Ferguson Publishing Co., 1969.

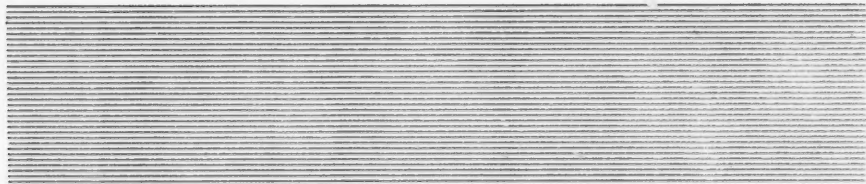
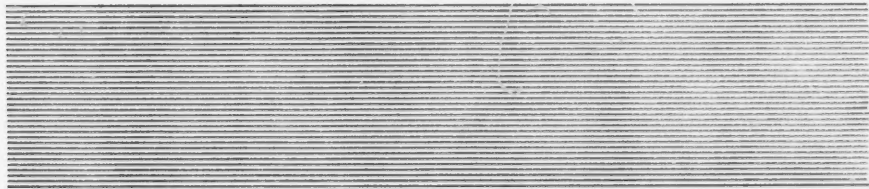
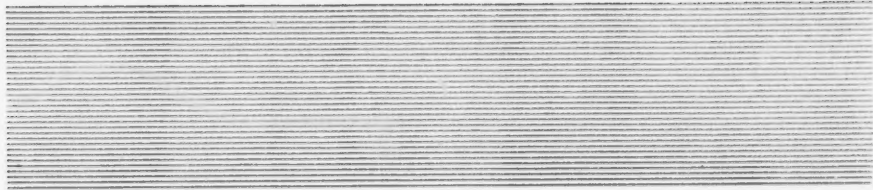
Brinkman, Elizabeth, and others. *Handbook on Inquiry Teaching in the Social Studies*. Research Paper, State Department of Education, 1972.

Ellis, Joseph V. "A Philosophical Analysis of the 'New' Social Studies," *The Social Studies*, October 13, 1971, Vol. 62.

Fenton, Edwin. "Inquiry Techniques in the New Social Studies," *The High School Journal*, October, 1971, Vol. LS.

PAMPHLETS

Beyer, Barry K. "Using Inquiry in the Social Studies—Guidelines for Teaching." College of Education, Ohio University, Athens, Ohio.



STATE OF NEBRASKA
DEPARTMENT OF EDUCATION
Cecil E. Stanley
Commissioner of Education
233 South 10th Street
Lincoln, Nebraska 68508

